

Remarks

Status of application

Claims 1-55 were examined and stand rejected in view of prior art. The claims have been amended to further clarify Applicant's invention for distinguishing it over the prior art of record. Reexamination and reconsideration are respectfully requested.

The invention

Applicant's invention comprises a system with methodology for performing relational operations over a combination of relational data and data retrieved from a web service. Applicant's invention represents methods of web services as proxy tables in the database system and creates and stores meta data about the mappings to methods of web services in a database system table. When a database operation (e.g., a query submitted by a user) is performed on a proxy table representing a method of a web service, the system interacts with the web service to retrieve data from the web service and convert it for use at the database based on the mapping. This enables relational operations may be performed on data retrieved from the web service as well as data stored in the database system.

General

A. Section 101 Rejection

Claims 21-39 and 55 stand rejected under 35 U.S.C. 101 on the basis of non-statutory subject matter. Here, the Examiner rejects claim 22 as reciting a system comprised entirely of software per se according to one of ordinary skill in the art. Applicant respectfully believes that the Examiner has incorrectly construed Applicant's specification as stating that the elements of Applicant's invention can only be implemented in software. In fact, Applicant's specification expressly states that the elements may be implemented in hardware, software or firmware (or combinations thereof). This is expressly stated, for example, at [paragraph 33] of Applicant's specification as follows: "...the corresponding apparatus element may be configured in hardware, software, firmware or combinations thereof" (Applicant's specification, paragraph [0035], emphasis added). Applicant's specification also describes in detail a

computer hardware and software environment in which Applicant's invention may be implemented (Applicant's specification, paragraphs [0035]-[0044]). Moreover, Applicant states that the software (computer-executable instructions) direct operation of a device under processor control, such as a computer (Applicant's specification, paragraph [0089]). Although Applicant does not believe that Claim 22 should be construed as constituting software per se, Applicant has amended independent claim 22 to specifically indicate that the system is implemented in a computer connected to a network and having access to a remote service. Therefore, as Applicant's amended claim 22 clearly defines a useful machine or item of manufacture in terms of a hardware or hardware and software combination, Applicant respectfully believes that it defines a statutory product and overcomes the rejection of claims 22-39 under Section 101.

The Examiner has also rejected claims 21 and 55 on the basis that processor-executable instructions are considered to be software per se. Applicant has amended claims 21 and 55 to provide that the processor executable instructions are stored on a web server. In addition, these claims are dependent upon, and incorporate the limitations of, Applicant's independent claims 1 and 40, which that Examiner has not objected to as lacking statutory subject matter.

In view of the above-mentioned amendments, it is respectfully submitted that the rejection of claims 21-39 and 55 under Section 101 is overcome.

Prior art rejections

A. Section 102 Rejection: Brown

Claims 1-55 stand rejected under 35 U.S.C. 102(e) as being anticipated by US PGPub 2003/0093436 to Brown et al (hereinafter "Brown"). The Examiner's rejection of claim 1 is representative:

Referring to claim 1, Brown discloses a method for performing database operations on data obtained from a web service, the method comprising:

creating at least one proxy table in a database, each proxy table mapping to a method of the web service [creating a virtual table representative of the web service] (Brown: see [0062]-[0063] and [0074]);

in response to a database operation on a particular proxy table, converting the

database operation into a format for invoking a particular method of the web service based upon the corresponding mapping (Brown: see [0049]);

invoking the particular method of the web service (Brown: see [0057]-[0059]);
converting results obtained from invoking the particular method into data for use at the database based upon the corresponding mapping (Brown: see [0074]); and

performing the database operation on the data at the database to generate a result set (Brown: see [0075]-[0077], lines 1-2); and

returning the result set in response to the database operation (Brown: see [0075]-[0077], lines 1-2).

Under Section 102, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in the single prior art reference. (See, e.g., MPEP Section 2131.) As will be shown below, Brown fails to teach each and every element set forth in Applicant's claims 1-55 and therefore fails to establish anticipation of the claimed invention under Section 102.

Applicant's invention creates mappings to methods of web services and encapsulates these mappings in proxy tables that are used to represent methods of web services (Applicant's specification, paragraphs [0128]-[0129]). During the creation of these proxy tables, meta data about these mappings is also created and stored by Applicant's system to enable the remote web service to be located and called in response to an operation on the proxy tables (Applicant's specification, paragraph [0091]). Applicant's system creates this meta data about mappings between the proxy tables and the remote service and stores the meta data in system tables of the database (Applicant's specification, paragraphs [0081] and [0085]). For example, Applicant's system creates a "Call" object for each web method and stores the object in the "sysattributes" system table (Applicant's specification, paragraph [0087]). This meta data is used when a database operation (e.g., SQL query) on the proxy table representing the remote web service is received to map the relational data types to the appropriate representation expected by the web method (Applicant's specification, paragraph [0094]). Applicant's claims have been amended in an effort to bring these features of generating and storing mapping meta data in the database to the forefront. For instance, Applicant's amended claim 1 includes the following claim limitations:

A method for performing database operations on data obtained from a web service, the method comprising:
creating at least one proxy table in a database, each proxy table mapping to a method of the web service;
generating meta data about the mapping and storing the meta data in a database table of the database;
in response to a database operation on a particular proxy table, using the meta data for converting the database operation into a format for invoking a particular method of the web service based upon the corresponding mapping;
invoking the particular method of the web service;
converting results obtained from invoking the particular method into data for use at the database based upon the corresponding mapping;

(Applicant's claim 1, as amended, emphasis added)

As described above, Applicant's solution generates and stores meta data about the mapping in database tables. This meta data is used in response to operations on the proxy table representing a method of a remote service for purposes of invoking the remote service. In contrast, Brown's system relies on mapping information stored in a file that is external to the database which is referred to as "DADX" or "Document Access Definition" file (Brown, paragraph [0045]). This is also shown at Fig. 6 which illustrates the DADX file 51 associated with the Websphere Application Server 63 (Brown, Fig. 6). The DADX file is a configuration file that defines the operations that can be performed by the Web Service (Brown, paragraph [0050]). As described at paragraph [0029] of Brown:

The service provider creates DAD and DADx documents and deploys them to the web application. Each DADx document is associated with a URL that identifies a specific web service.

(Brown, paragraph [0029], emphasis added)

Significantly, the DADX file is a user-specified mapping file that creates the associations between the relational data and XML document structure. It is not automatically generated by Brown's system. This reliance on input of the mapping file is described by Brown as follows:

One of the inputs into both storage and retrieval is the user-specified mapping file.

37 that creates the association between relational data and XML document structure. This mapping file 37 is called a Document Access Definition (DAD) 37 and provides a way to create an XML document 35 and specify the XML elements, attributes and shape desired. The focus of this approach is in moving and manipulating XML documents.

(Brown, paragraph [0045]), emphasis added)

As described above, Brown's system relies on a user-specified mapping file which is received as input to Brown's system. Applicant's invention, in contrast, automatically creates the mapping and generates mapping meta data which is stored for subsequent use when operations on proxy tables representing the remote service are performed. Thus, Applicant's solution automates the process of integrating a remote service and does not rely on input of a mapping to the remote service.

In addition, Applicant's solution stores data about the mappings to methods of the remote service in database system tables, which provides several benefits compared to Brown's approach of relying on external mapping files. A primary benefit is that storing the mapping data in the database means that existing database backup functions can be used for backing up this data. With Brown's system, backing up also requires taking additional steps to backup the external DADX files. Replication is also easier because the meta data is stored in the database. As a result, standard database replication methods may be used. With Brown's approach of using an external file, modifications to standard replication methods would be required to provide for replication of the external DADX files. In both replication and backup scenarios, extra steps must be taken to properly handle the external file in addition to the data stored in the database. Applicant's approach of storing the mapping data in the database avoids the need for these additional steps. Applicant's solution also facilitates system administration. Storing the mapping data in the database means that the data is within the security model of the database, thereby providing better security over access to the data.

Although Brown includes some features similar to those of Applicant's invention, it relies on user-specified mapping files for input while Applicant's solution automatically generates the mappings to facilitate the integration of data from a remote service with relational data. Applicant also provides for storing the mapping data in the database,

which provides for easier backups and replication and better administration and security compared to maintaining the mapping data outside the database in an external file. Therefore, as Brown does not teach or suggest all of the claim limitations of Applicant's claims 1-55 it is respectfully submitted that the claims distinguish over this reference and overcome any rejection under Section 102.

Any dependent claims not explicitly discussed are believed to be allowable by virtue of dependency from Applicant's independent claims, as discussed in detail above.

Conclusion

In view of the foregoing remarks and the amendment to the claims, it is believed that all claims are now in condition for allowance. Hence, it is respectfully requested that the application be passed to issue at an early date.

If for any reason the Examiner feels that a telephone conference would in any way expedite prosecution of the subject application, the Examiner is invited to telephone the undersigned at 925 465 0361.

Respectfully submitted,

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